



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/612,543	07/07/2000	Makoto Funabashi	1982-0153P	9387

7590 07/03/2003

Birch Stewart Kolasch & Birch LLP
P O Box 747
Falls Church, VA 22040-0747

EXAMINER

CLEVELAND, MICHAEL B

ART UNIT	PAPER NUMBER
----------	--------------

1762

DATE MAILED: 07/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/612,543

Applicant(s)

FUNABASHI, MAKOTO

Examiner

Michael Cleveland

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-19 is/are allowed.
- 6) ☒ Claim(s) 1-13 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 9, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beutel et al. (U.S. Patent 5,145,743, hereafter '743).

'743 teaches dispersing a binder in dispersion medium (col. 4, line 63-col. 5, line 16), dispersing a calcined (col. 2, lines 56-60) phosphor in the dispersion medium (col. 5, lines 18-20), wet classifying the phosphor (col. 5, lines 23-25), and applying the material to a support and drying to form a phosphor layer (col. 5, lines 25-30). Applicant has defined a "soluble" binder as "having solubility sufficient for preparing the phosphor layer coating liquid which can be applied for forming a phosphor layer" (paragraph bridging pages 12 and 13 of the specification). Thus, because the binder of '743 is applied to form a phosphor layer, it meets Applicant's definition of soluble.

It does not teach that the specific order of adding phosphor to the dispersion medium, wet classifying, and then adding the binder. However, it has long been settled that the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See, for instance, *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) and MPEP 2144.04.II.C. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have performed the steps in the order of adding the phosphor, wet classifying, and adding the binder instead of adding the binder, adding the phosphor and wet classifying with the expectation of similar results and with a reasonable expectation of success because the final coating slurry would have been substantially identical.

Claim 2: The solvent may be organic (col. 5, line 1).

Claim 9: Wet classification may be by filtration (col. 5, lines 23-25).

Claim 13: '743 teaches a binder to phosphor ratio of about 1:10 (col. 5, lines 1-35).

Art Unit: 1762

3. Claims 1-3, 5-7, 9-10, 12-13, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weiss et al. (U.S. Patent 4,028,550, hereafter '550) in view of Leblans et al. (U.S. Patent 5,360,578, hereafter '578).

'550 teaches dispersing a binder and a barium fluorohalide phosphor in a dispersion medium (col. 3, line 65-col. 4, line 15), wet classifying the phosphor (col. 4, lines 10-12), and applying the material to a support and drying to form a phosphor layer (col. 4, lines 31-41). Applicant has defined a "soluble" binder as "having solubility sufficient for preparing the phosphor layer coating liquid which can be applied for forming a phosphor layer" (paragraph bridging pages 12 and 13 of the specification). Thus, because the binder of '550 is applied to form a phosphor layer, it meets Applicant's definition of soluble.

'550 does not teach that the specific order of adding phosphor to the dispersion medium, wet classifying, and then adding the binder. However, it has long been settled that the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See, for instance, *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) and MPEP 2144.04.II.C. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have performed the steps in the order of adding the phosphor, wet classifying, and adding the binder instead of adding the binder, adding the phosphor and wet classifying with the expectation of similar results and with a reasonable expectation of success because the final coating slurry would have been substantially identical.

'550 also does not teach that the phosphor is calcined. In fact, '550 is silent as to the method of preparing the barium fluorohalide phosphor. '578 teaches that barium fluorohalide phosphors may be prepared by mixing the appropriate components and then calcining (col. 6, line 50-col. 7, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have performed the process of '550 using a calcined phosphor with a reasonable expectation of success because '578 teaches that calcining is a conventional method of making such phosphors.

Claim 2: The dispersion medium may be organic ('550, col. 4, lines 8-9).

Claim 6: Although the nomenclature is different, the phosphors disclosed by '550 (col. 2, lines 26-30 and Example 1) appear to be covered by applicant's formula. '578 uses a formula more easily comparable to Applicant's: The formula for useful phosphors is given at col. 2, lines

Art Unit: 1762

6-17. "a" in claim 6 is equivalent to "x" of the formula of '578, and "x" of claim 6 is equivalent to "y" of '578. '578's "x", "M^{II}", and "A" overlaps Applicant's claimed ranges for their equivalents: "a", "M^{II}", and "Ln", respectively. '578's "X" and "y" are identical to Applicant's claimed ranges for their equivalents: "X" and "x", respectively. Applicant's "b", "c", and "d" are 0 in the formula of '578, which is within Applicant's claimed ranges for them.

Claim 9: The wet classification may be by filtration ('550, col. 4, lines 10-11).

Claim 13: '550 teaches a binder to phosphor ratio of about 1:14 (Example 1).

Claims 3 and 12: '578 teaches that is desirable to classify the particles in order to remove both large (greater than 40 microns) and small (smaller than 2 microns) particles for the reasons given at col. 3, lines 31-56. The particles may be wet sieved to remove the large particles (col. 4, line 56-col. 5, line 13). The undesired small particles may be removed "before drying", which appears to refer to the wet classification step, by sedimenting the desired particles gravitationally or centrifugally and removing the liquid (i.e., decanting) containing the fine particles continuously (col. 5, lines 34-43).

Claim 5: The particles are sieved by passing through meshes (col. 4, line 50-col. 5, line 7). Particles over 40 microns in size are undesired (col. 3, lines 30-42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a maximum final mesh size of 40 microns, which is less than 50 microns, in order to achieve the desired particle size range.

Claim 7: '578 teaches a ratio of approximately 20 parts phosphor per 100 parts dispersing medium for sieving (e.g., Example 1, Example 10).

Claim 9: '578 teaches that the sieving may occur by vibrating the meshes (i.e., screens) (col. 4, lines 50-68).

Claim 10: '578 teaches that the particles may be sieved through a plurality of stages having decreasing mesh size (col. 4, line 56-col. 5, line 13).

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weiss '550 in view of Leblans '578 and further in view of Jamil et al. (U.S. Patent 5,772,916, hereafter '916).

Weiss '550 and Leblans '578 teach the limitations of claim 1, as discussed above. They do not teach that the wet classification a plurality of times. However, '578 does teach a desired size distribution to achieve (col. 4, lines 13-25).

Art Unit: 1762

Jamil '916 teaches sieving a phosphors a plurality of times in order to classify the phosphors to a desired size (col. 11, lines 47-62). The implication is that the repeating process aids in the goal of '916 of achieving a narrow phosphor particle size distribution (col. 6, lines 10-24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have repeated the sieving process of '578 in order to have achieved better control (i.e., a narrower distribution) of the particle size, as taught by '916.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weiss '550 in view of Leblans '578 and further in view of Ochiai (U.S. Patent 4,501,971, hereafter '971).

Weiss '550 and Leblans '578 teach the limitations of claim 1, as discussed above.

Claim 8: '550 teaches mixing by ball milling for 16 hours. '578 teaches that the phosphor is dispersed in the medium by stirring vigorously (i.e., turbulently) (col. 11, lines 59-63). However, it is silent as to the stirring mechanism and therefore does not suggest that the stirring occurs with a mixing blade. '971 teaches that phosphor dispersions may be thoroughly mixed by using a propeller mixer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a propeller (i.e., a mixing blade) mixer as the particular mixing mechanism of '550 and '578 with a reasonable expectation of success.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weiss '550 in view of Leblans '578 and further in view of Hultsch et al. (U.S. Patent 4,405,454, hereafter '454).

Weiss '550 and Leblans '578 teach the limitations of claim 1, as discussed above. They do not teach that the classification occurs by pressure filtration. However, '578 indicates that a wide variety of methods are suitable for classifying the particles (col. 4, lines 45-49).

'454 teaches that pressure filtration is another method suitable for classifying particles from dispersions (Abstract, col. 2, lines 56-68). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pressure filtration as the wet classification method of '550 and '578 with the expectation of the similar results.

Allowable Subject Matter

7. Claims 14-19 are allowed.

8. The following is an examiner's statement of reasons for allowance: The prior art of record does not fairly teach or suggest the preparation of a radiation imaging panel by creating a

Art Unit: 1762

slurry of a phosphor, classifying the slurry, and substituting the dispersion medium of the slurry with another medium, all while maintaining the slurry before adding a binder and applying the coating material.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

9. Applicant's arguments filed 4/24/2003 have been fully considered but they are not persuasive.

Applicant argues that the order of steps results in unexpected results because classifying before allows a finer sieve to be used. The arguments are unconvincing because they are not commensurate in scope with the claims which do not require a 20 micron mesh size. The argument is further unconvincing because it is unsupported by evidence. Even though the examples of Beutel and Weiss use coarser meshes than Applicant's example, there is no showing that the slurries of Beutel and Weiss would have been unclassifiable by finer meshes. Such an assertion would be contradicted by Alles '183, cited in the previous action, which indicates that slurries containing phosphor and binder may be classified to obtain particles of 3-6 microns.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rabatin (U.S. Patent 4,360,571, Example 1), Alles (U.S. Patent 2,819,183, col. 2, lines 1-22), and Rabatin (U.S. Patent 4,208,470, Example 1) also show examples of wet classification of slurries of a phosphor and a binder before applying them to form a panel.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (703) 308-2331. The examiner can normally be reached on 9-5:30 M-F.

Art Unit: 1762

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 306-3186 for regular communications and (703) 306-3186 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

MBP

MBC

July 2, 2003



SHRIVE P. BECK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700